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UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/798,519	03/11/2004	John Sievers	199-0231US	7245

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WONG, CABELLO, LUTSCH, RUTHERFORD & BRUCCULERI, L.L.P. 20333 SH 249 SUITE 600 HOUSTON, TX 77070	FINDLEY, CHRISTOPHER G

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

PTOL-90A (Rev. 04/07)

	Application No.	Applicant(s)
Office Action Summary	10/798,519	SIEVERS ET AL.
	Examiner	**Art Unit**	
	Christopher Findley	2621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>07 November 2007</u>.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-33* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-33* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _____ .

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application

6)☐ Other: _____ .

DETAILED ACTION

Response to Arguments

1.   Applicant's arguments filed 11/07/2007 have been fully considered but they are not persuasive.

2.   Re claims 1 and 15, the Applicant contends that neither Brooks nor Sekiguchi, alone or in combination, teaches or suggests "increasing video quality as a function of a fraction of macroblocks that are skipped," as recited in the claim (Applicant's Remarks: page 2, line 7, through page 3, line 15). However, the Examiner respectfully disagrees. One of ordinary skill in the art at the time of the invention would have found it obvious that the relationship between input video parameters, bandwidth limitations, and decoding–side processing capabilities and restraints would be represented in a cost function used for altering the coding scheme of Brooks. As such, the change in bit-rate resulting from macroblock skipping would impact the constraints on available bandwidth (Sekiguchi: paragraph [0003], "The need is growing for reusing video contents compressed by these coding schemes in a variety of platforms under conditions different in... transmission bit rates"), and, in turn, the alterations made to the video being encoded (Brooks: column 3, lines 12-14 and column 3, line 66, through column 4, line 2; Figs. 6A and 6B, step 900).

3.   Re claims 22 and 27, the Applicant contends that neither Brooks nor Sekiguchi, alone or in combination, teaches or suggests "increasing video quality as a function of an encoder model of decoder processing load to take advantage of decoder processing capability that would otherwise be unused," as recited in the claim (Applicant's

Remarks: page 3, line 16, through page 4, line 8). However, the Examiner respectfully

disagrees. Brooks discloses altering video parameters on the encoding side in

accordance with the capabilities of the target decoder (Brooks: Fig. 5A, step 610;

column 15, lines 30-42; Fig. 5B, step 680 (transcoding operation) corresponds to Figs.

6A and 6B).

4.   Therefore, the Examiner maintains the previous rejection of claims 1, 15, 22, and

27 under Brooks et al. (US 7114174 B1) in view of Sekiguchi et al. (US 20050041740

A1). A copy of the original rejection is included below.

Claim Rejections - 35 USC § 103

1.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

2.   **Claims 1-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over**

Brooks et al. (US 7114174 B1) in view of Sekiguchi et al. (US 20050041740 A1).

Re claim 1, Brooks discloses a method of quality-improvement of a digitally-

encoded video sequence, wherein the video sequence comprises information

representing a sequence of encoded frames, each encoded frame comprising one or

more encoded macroblocks, the method comprising: determining one or more

processing capabilities of a decoder that will decode the video sequence (Brooks: Fig.

6A, elements 810, 840, and 870; the video stream is manipulated to meet a target

output color depth, resolution, and frame rate); encoding macroblocks of a first image

(Brooks: Fig. 6B, element 930; the data is encoded); and increasing video quality to

take advantage of decoder processing capability that would otherwise be unused as a

result of the skipped macroblocks (Brooks: Fig. 6A; column 3, lines 8-14). Brooks does

not specifically disclose encoding macroblocks of subsequent images, wherein some

macroblocks are skipped and determining a target video quality for the output stream as

a function of a fraction of macroblocks that are skipped. However, Sekiguchi discloses

a video data conversion method, where some macroblocks are skipped in the encoding

process (Sekiguchi: Fig. 2, element ST0) and the coding mode is determined by

analyzing a cost function if the frame is a mix of skipped blocks and non-skipped blocks

(Sekiguchi: Fig. 7, coding mode estimator 8). Since both Brooks and Sekiguchi relate to

manipulating video data to meet output stream constraints, one of ordinary skill in the

art at the time of the invention would have found it obvious to combine the video data

conversion of Sekiguchi with the quality manipulation of Brooks in order to provide a

more robust encoder, which can hold up to the change in data used for motion

estimation, which results from the change in resolution (Sekiguchi: paragraph [0010]).

The combined method of Brooks and Sekiguchi has all of the features of claim 1.

Re claim 2, the combined method of Brooks and Sekiguchi discloses that the

step of determining one or more processing capabilities of a decoder comprises having

prior knowledge of the decoder type

Re claim 3, the combined method of Brooks and Sekiguchi discloses that the

step of determining one or more processing capabilities of the decoder comprises

receiving processing capability information from the decoder (Brooks: column 3, lines

12-14, adaptation is made with respect to encoding format).

Re claim 4, the combined method of Brooks and Sekiguchi discloses that the

step of determining one or more processing capabilities of the decoder comprises

determining the number of macroblocks that can be decoded in a given interval if all

macroblocks are skipped (Brooks: Fig. 7, the coding mode is selected based on a cost

function if some macroblocks in the frame are skipped and other macroblocks are not).

Re claim 5, the combined method of Brooks and Sekiguchi discloses a majority

of the features of claim 5, as discussed above in claims 1 and 4, but does not explicitly

disclose that the step of increasing video quality comprises determining the maximum

frame rate in accordance with the following expression:

$$MaxFrameRate = \frac{1}{\frac{N_{coded}}{MaxMBPS} + \frac{N_{skipped}}{MaxSKIPPED}}$$ where N_{coded} is the number of coded macroblocks

per frame, $N_{skipped}$ is the number of skipped macroblocks per frame, MaxMBPS is the

maximum number of macroblocks that can be decoded in a given interval, and

MaxSKIPPED is the maximum number of macroblocks that can be decoded in a given

interval if all macroblocks are skipped. However, The Examiner takes Official Notice

that one of ordinary skill in the art at the time of the invention would have found it

obvious to increase the frame rate of the video stream when less macroblocks are

encoded in order to maintain a constant bitrate by transmitting more frames when less

data is present in each frame.

Re claim 6, the combined method of Brooks and Sekiguchi discloses that the

step of increasing video quality comprises increasing a video frame rate (Brooks: Fig.

6A, element 890).

Re claim 7, the combined method of Brooks and Sekiguchi discloses that the

step of increasing video quality comprises increasing a video picture size (Brooks: Fig.

6A, element 860).

Re claim 8, the combined method of Brooks and Sekiguchi discloses that the

step of increasing video quality further comprises increasing a video frame rate (Brooks:

Fig. 6A, element 890) as a function of a computational cost of the decoder to decode

various types of macroblocks (Sekiguchi: Fig. 7, the coding mode is selected based on

a cost function).

Re claim 9, the combined method of Brooks and Sekiguchi discloses that the

step of increasing video quality further comprises increasing a video picture size

(Brooks: Fig. 6A, element 860) as a function of a computational cost of the decoder to

decode various types of macroblocks (Sekiguchi: Fig. 7, the coding mode is selected

based on a cost function).

Re claim 10, the combined method of Brooks and Sekiguchi discloses taking

account of a number of coefficients included in the encoded macroblocks and a

computational requirement of the decoder as a function of this number (Brooks: Fig. 6B,

element 900; column 13, lines 57-64, varying the quantization scale changes the

number of coefficients).

Claim 11 has been analyzed and rejected with respect to claim 6 above.

Claim 12 has been analyzed and rejected with respect to claim 7 above.

Claim 13 has been analyzed and rejected with respect to claim 8 above.

Claim 14 has been analyzed and rejected with respect to claim 9 above.

Re claim 15, the combined method of Brooks and Sekiguchi discloses a method

for manipulating video streams, which may be used in a video conferencing terminal

(Brooks: column 3, lines 8-9, video streams are transformed) adapted to produce

encoded video including a sequence of encoded frames, each encoded frame

comprising one or more encoded macroblocks, the video conferencing terminal

comprising: one or more image processing engines adapted to encode a video signal,

wherein some macroblocks are skipped (Sekiguchi: Fig. 7, some macroblocks or all

macroblocks in a frame may be skipped); and a communication interface adapted to

determine one or more processing capabilities of a decoder that will decode the

encoded video and further adapted to increase video quality (Brooks: Figs. 6A and 6B)

as a function of a fraction of macroblocks that are skipped (Sekiguchi: coding made is

determined by a cost function when some macroblocks are skipped) to take advantage

of decoder processing capability that would otherwise be unused as a result of the

skipped macroblocks (Brooks: column 3, lines 8-14).

Claim 16 has been analyzed and rejected with respect to claim 4 above.

Claim 17 has been analyzed and rejected with respect to claim 5 above.

Claim 18 has been analyzed and rejected with respect to claim 6 above.

Claim 19 has been analyzed and rejected with respect to claim 7 above.

Claim 20 has been analyzed and rejected with respect to claim 8 above.
Claim 21 has been analyzed and rejected with respect to claim 9 above.

Re claim 22, arguments analogous to those presented in claim 1 are applicable to claim 22, and, therefore, claim 22 has been analyzed and rejected with respect to claim 1 above.

Claim 23 has been analyzed and rejected with respect to claim 2 above.

Claim 24 has been analyzed and rejected with respect to claim 3 above.

Claim 25 has been analyzed and rejected with respect to claim 6 above.

Claim 26 has been analyzed and rejected with respect to claim 7 above.

Re claim 27, arguments analogous to those presented in claim 1 are applicable to claim 27, and, therefore, claim 27 has been analyzed and rejected with respect to claim 1 above.

Claim 28 has been analyzed and rejected with respect to claim 4 above.

Claim 29 has been analyzed and rejected with respect to claim 5 above.

Claim 30 has been analyzed and rejected with respect to claim 6 above.

Claim 31 has been analyzed and rejected with respect to claim 7 above.

Claim 32 has been analyzed and rejected with respect to claim 8 above.

Claim 33 has been analyzed and rejected with respect to claim 9 above.

Conclusion

3.   The prior art made of record and not relied upon is considered pertinent to

applicant's disclosure:

    a.   Adaptable bitstream video delivery system

Vetro et al. (US 6490320 B1)

    b.   METHOD AND APPARATUS FOR MIXING COMPRESSED VIDEO

ESHKOLI et al. (US 20070120967 A1)

    c.   Transcoder

Christopoulos et al. (US 6526099 B1)

    d.   Apparatus and methods for improving video quality delivered to a display

device

    Baylon et al. (US 20030112366 A1)

4.   **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time

policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later

than SIX MONTHS from the mailing date of this final action.

Contact

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher Findley whose telephone number is (571) 270-1199. The examiner can normally be reached on Monday-Friday 8:30am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marsha D. Banks-Harold can be reached on (571) 272-7905. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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